

## **REMARKS**

This Amendment responds to the final Office Action mailed June 26, 2009 and is being enclosed with a Request for Continued Examination submitted concurrently herewith. This Amendment represents a submission fully responsive to the June 26, 2009 Office Action, as required under 37 CFR § 1.114. Claims 1-6, 8, and 25-28 are pending. Claims 1-6, 8, and 25-28 have been amended. Claim 34 has been cancelled. In view of the following remarks, as well as the preceding amendments, Applicants respectfully submit that all claims in this application are in complete condition for allowance and request reconsideration of the application in this regard.

### **Rejections of Claims under 35 U.S.C. § 112, 2<sup>nd</sup> Paragraph**

Claims 1-6, 8, and 34 stand rejected under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph. Applicants have amended claim 1 in a manner believed sufficient to overcome the rejection. Claim 34 has been cancelled.

### **Rejections of Claims under 35 U.S.C. § 103**

Claims 1-6, 8, 25-28, and 34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,566,704 to Choi et al. (hereinafter *Choi*). Claims 1 and 25 are independent claims. Applicants respectfully disagree with this rejection for the reasons set forth below.

In determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. In this instance, Applicants submit that the claimed inventions set forth in claims 1 and 25 would not have been considered obvious when considered as a whole.

With regard to independent claim 1, the Examiner concludes that “*Choi* et al. do not explicitly state in the embodiment of figure 3F a plurality of semiconducting nanotubes and

plurality of dielectric layers.” To remedy this deficiency, the Examiner contends that “figures 1-3 depict only a unit cell of the transistor” and that “it would have been obvious ... to use a plurality of semiconducting nanotubes in Choi et al.’s device into order to use the device in a practical application which requires a plurality of semiconducting nanotubes, such as a nano sized transistor”. On page 9 of the Office Action, the Examiner “agrees that ‘each semiconductor device structure in Choi includes one nanotube and one channel region’” and then elaborates that “said ‘each semiconductor device structure’ in Choi is only one unit cell, and the final device structure comprises plurality of unit cells”. On this basis, the Examiner concludes that “the final device structure of Choi multiple channel regions, as claimed”.

The unit cell shown in Figure 3F of *Choi* has a source (40), a drain (50), and a single nanotube (100). However, when multiple unit cells of Figure 3F, each having a single nanotube (100), are assembled into a final device structure as contended by the Examiner to include multiple nanotubes (100), none of the individual unit cells in the assembly will have the same source region and the same drain region. Each unit cell in the assembly will be individually addressable, as otherwise the assembly would not function. This is reflected, for example, in Figure 4B of *Choi* that shows a different structure not relied upon in the rejection, but in which the sources and drains for the nanotubes (100) are laid out in a grid pattern.

Claim 1 sets forth that “each of said semiconducting nanotubes including a first end electrically coupled with said source region” and “a second end electrically coupled with said drain region”. This is absent from the disclosure in *Choi* as construed by the Examiner. Hence, when the Graham factual inquiries are considered, there are unresolved differences between independent claim 1 and the disclosure in *Choi* that preclude a *prima facie* case of obviousness. For at least this reason alone, Applicants request that the rejection of independent claims 1 and 8 be withdrawn.

Because claims 2-6 and 8 depend from independent claim 1, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these dependent claims recite unique combinations of elements not disclosed or suggested by *Choi*.

Independent claim 25 recites that each of the dielectric layers has “a second portion disposed between one of said nanotubes and said second plate”. In contrast, *Choi* discloses that the “[t]he lower and upper parts of each carbon nanotube are connected to a source and a drain, respectively, with a gate interposed between the source and the drain for performing switching”. See col. 1, lines 55-58. The Examiner identifies the claimed dielectric layer as the object labeled with reference numeral (30) in Figure 3F of *Choi* and the claimed second plate as the object labeled with reference numeral (50) in Figure 3F of *Choi*. In Figure 3F, one end of the nanotube (100) is connected with source (40), but no portion of the dielectric layer (30) is disposed between one end of the nanotube (100) and the second plate (50). Instead, the opposite end of the nanotube (100) in Figure 3F is connected with the second plate (50).

Consequently, under the framework of the *Graham* factual inquiries, the Examiner has not established *prima facie* obviousness because there are unresolved differences between independent claim 25 and the disclosure in *Choi*. Specifically, *Choi* fails to disclose that each of the dielectric layers has “a second portion disposed between one of said nanotubes and said second plate such that the second portion separates the respective one of said nanotubes from said second plate”. For at least this reason, Applicants respectfully request that the Examiner withdraw the rejection.

Because claims 26-28 depend from independent claim 25, Applicants submit that these claims are also patentable for at least the same reasons discussed above. Furthermore, these dependent claims recite unique combinations of elements not disclosed or suggested by *Choi*.

### **Conclusion**

Applicants have made a bona fide effort to respond to each and every requirement set forth in the Office Action. In view of the foregoing remarks and amendments, this application is submitted to be in complete condition for allowance and, accordingly, a timely notice of allowance to this effect is earnestly solicited. In the event that any issues remain outstanding, the Examiner is invited to contact the undersigned to expedite issuance of this application.

Applicants do not believe fees are due in connection with filing this communication other than an RCE fee. If, however, any fees are necessary as a result of this communication, the Commissioner is hereby authorized to charge any under-payment or fees associated with this communication or credit any over-payment to Deposit Account No. 23-3000.

Respectfully submitted,

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Date

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